REMARKS

By the foregoing amendments several corrections have been made in the application specification and drawings, claims 18 and 39 have been canceled and claims 17, 19, 27, 30, 34 and 38 have been amended. Thus, claims 17 and 19-38 remain in the application.

Claims 17, 27 and 38 were rejected in the outstanding Office Action under 35 U.S.C. §112, second paragraph, as being indefinite for the reasons stated on page 2 of the Office Action. In particular, in claims 17 and 38 the recitation "nearly devoid of ultrafine components" was alleged to be indefinite as to what amounts fall within the limitation "nearly devoid", and as to what sizes fall within the limitation "ultrafine". Regarding claim 27, it was alleged that the basis for comparison of the filling ratio is unclear and indefinite. This rejection is hereby traversed and reconsideration thereof is respectfully requested in view of the above amendments to the claims in Applicants remarks set forth below.

Responsive to the rejection, by the amendments claims 17 and 38 have been amended to omit the allegedly indefinite expression. Each of the claims now recites that the proportion of fines in the radioactive material having a grain size of less than 250 μm amounts to less than 30 wt% of the radioactive material (claim 17)/radioactive graphite (claim 38). Claim 27 has been amended to more clearly recite the basis for comparison. That is, the filling ratio of the at least one of the embedding material, mortar and casting resin produced by the mixture with radioactive material is higher than the filling ratio produced by the mixture with conventional aggregates in the mixture as recited in the claim unsubstituted for by the radioactive material. In

view of these changes, it is respectfully submitted that the claims as amended are proper under 35 U.S.C. §112, second paragraph.

Claims 17-22, 25-27, 30 and 31 were rejected in the Office Action under 35 U.S.C. §102(b) as being anticipated by Roy et al., U.S. 5,545,796 as stated on pages 2 and 3 of the Office Action. Claims 17-22, 25-27, 30 and 31 stand further rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Roy et al. as set forth on pages 3 and 4 of the Office Action. Claims 17-22, 35-37, 30 and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Roy et al. in the manner set forth on pages 4 and 5 of the Office Action.

Claims 23, 24, 29, and 32-39 had been rejected under 35 U.S.C. §103(a) as being unpatentable over Roy et al. as applied to claims 17-22, 25-27, 30 and 31, and further in view of DE 3131798 A1. The references were combined as stated on pages 5 and 6 of the Office Action. Claim 28 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Roy et al. as applied to claims 17-22, 25-27, 30 and 31, and further in view of Laske et al., U.S. 4,732,705 as set forth on page 6 of the Office Action.

These prior art rejections of the application claims are hereby traversed and reconsideration thereof is respectfully requested in view of the above amendments to the claims and Applicants remarks as set forth below.

At the outset, Applicants note that the application claims initially presented in the above-identified application correspond closely to those originally filed in the corresponding international application. However, an amendment of the claims in the international application was made prior to the International Preliminary Examination Report in the corresponding

international application and the Report was made with respect to the amended international application claims. A copy of the International Preliminary Examination Report is enclosed along with a English translation of the revised claims in the international application which have been the basis for the International Preliminary Examination Report. As seen from the English translation of the revised claims in the international application, revised claim 1 recites that the grain size of the radioactive material of less than 250 μm amounts to less than 30wt% of the radioactive material to be disposed and replaces, at least partially, the aggregate material of the binder system. The revised claims were found to meet the standards of novelty, inventive step and industrial applicability for patenting in the International Preliminary Examination Report. By the above amendments, the claims in the above-identified application have been amended to include similar limitations to those in the revised claims in the international application.

The patent to Roy et al., U.S. 5,545,796, relied upon solely, and in combination with DE 3131798 A1 and Laske et al., U.S. 4,732,705, in the aforementioned rejections of the claims in the outstanding Office Action does not include any matter which is different from the already known state of the art. Roy et al. disclose an article made out of radioactive or hazardous waste and a method of making the same. However, Applicant notes that in Roy et al. nothing concrete is said about the grain size, which means that nothing is stated about the grain and nothing is said about the amount of fines within the binder system. The teaching of Roy et al. focuses on dispersing radioactive hazardous waste in a conventional matrix of either concrete binder or plastic resin to form an article. See column 5 of the patent. In the embodiment

illustrated in Figure 6, the matrix or binder 42 is made up of sand filler 36 and cement 38. Interspersed within the matrix, not substituted for an aggregate of the binder or matrix, are fine fly ash particles 40, radioactive metal fibers 44 and/or radioactive ground, large concrete aggregate or other hazardous material 46. Concerning Figure 7, Roy et al. state in column 12 that the embodiment of the method uses an uncontaminated sand and cement matrix within which are interspersed radioactive metal and radioactive concrete additives. The only statement concerning substitution for an aggregate of a binder/aggregate mixture for producing the matrix material occurs in column 14 wherein Roy et al. state that amorphous radioactive metal slag particles resulting from water quenching of slag, as shown in Figure 6 can be used as filler in substitution for part of the sand as long as it is round if needed to fit into the sand particle size range, that is, a thickness from about 0.015 mm to about 10 mm. Roy et al. also make no mention of disposing of radioactive reactor graphite. The specific method for disposal of radioactive materials, casting compound, and casting of the present invention as recited in the application claims as amended are not disclosed or rendered obvious by Roy et al.

In Applicants disclosed embodiment, it is the radioactive cement mortar matrix, 11 in Figures 1 and 2, which is formed of the binder/aggregate mixture for producing the embedding material/mortar, its aggregate partially substituted by at least one radioactive material to be disposed of in which the proportion of fines in the radioactive material having a grain size of less than 250 μm amounts to less than 30wt%. It is this matrix 11 in which are

dispersed the waste graphite and concrete fragments 3, 5, 7 and 9 shown in Figures 1 and 2.

Applicants note that an important feature of the present invention is the proposal that, instead of e.g. sand, to be disposed material, such as e.g. reactor graphite, is used as aggregate material in the binder/aggregate mixture for producing the embedding material/mortar/casting resin. Due to the existing requirements at the disposal of radioactive material, it has been considered as being important that the amount or the fraction of ultrafine grains within the used radioactive material being used as aggregate in the mixture must be very small, such e.g. claimed in the present invention, and that the amount of material finer than 250 μm should not be higher than 30%, preferably less than 15%. Due to various tests performed by the assignee at its laboratories, it has been found that by using reactor graphite as an aggregate in the binder/aggregate mixture for producing the embedding material/mortar, and casting resin, it is essential to achieve a very high packing density within the aggregate. In opposition to the use of sand as an aggregate, the decrease of the compression strength can be dramatic after the use of the ground reactor graphite as an aggregate if an optimal packing density is not achieved by having an appropriate distribution of the grain sizes. This decrease of the compression strength is based very likely on the fact that graphite can be used as dry lubricant and therefore, if the packing density is not optimal, these lubricant characteristics of the graphite will become dominant. In other words, the given border values of less than 250 μm with an amount of less than 30wt% as recited in Applicants claims as amended, are essential for achieving the optimal packing density.

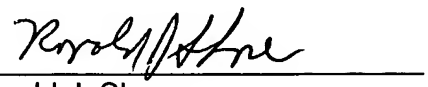
Consequently, the given values are of great importance and again nowhere in Roy et al. are any values about grain size or fraction amounts given. Furthermore, the reference does not teach or suggest a method for disposing of radioactive graphite. The emphasis is on the use of conventional binder/aggregate mixtures within which radioactive materials are dispersed to create an article, rather than partial substitution for an aggregate of the binder/aggregate mixture for producing at least one of an embedding material, a mortar and a casting resin by at least one radioactive material to be disposed of in which the proportion of fines in the radioactive material have made a grain size of less than 250 μm amounts to less than 30wt% as disclosed and claimed by Applicants.

The secondary references DE 3131798 A1 and Laske et al. relied upon in the rejections of several of the dependent claims do not provide for the aforementioned deficiencies of Roy et al. DE '798 was merely cited for its disclosure of wet grinding radioactive reactor graphite to particles having sizes of less than 60 mm. The reference does not propose substituting for the aggregate of the cement radioactive material to be disposed of in which the proportion of fines in the radioactive material having a grain size of less than 250 μm amounts to less than 30wt% as disclosed in claims by Applicants.

In view of the above amendments and remarks, it is respectfully submitted that Applicants claims as amended now patentably define over the applied references. Accordingly, reconsideration and allowance of the claims as amended is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Case No. 635.40828X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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Attachments

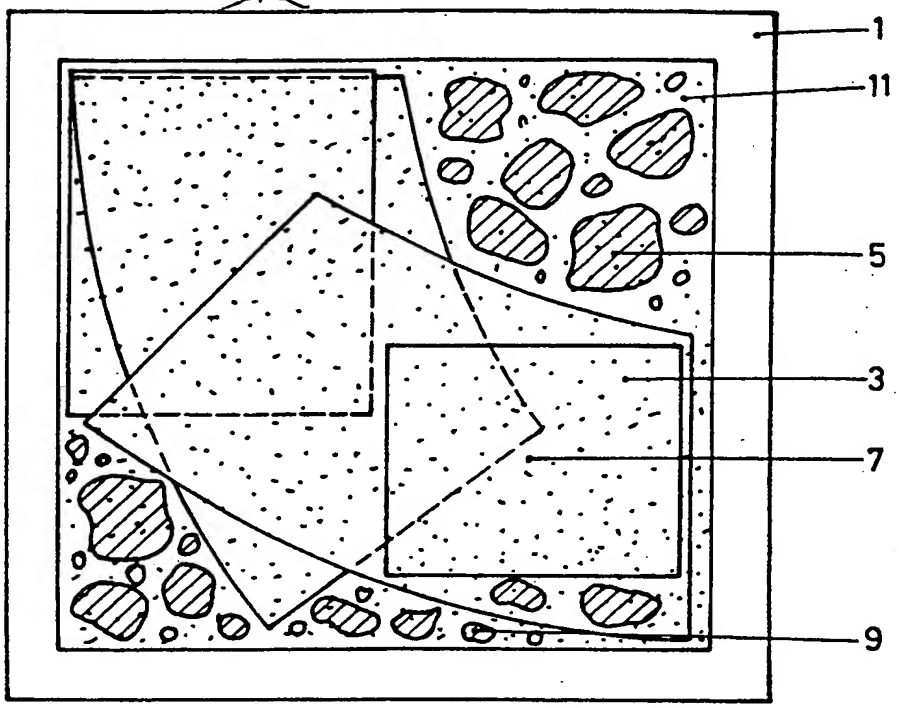


FIG.1

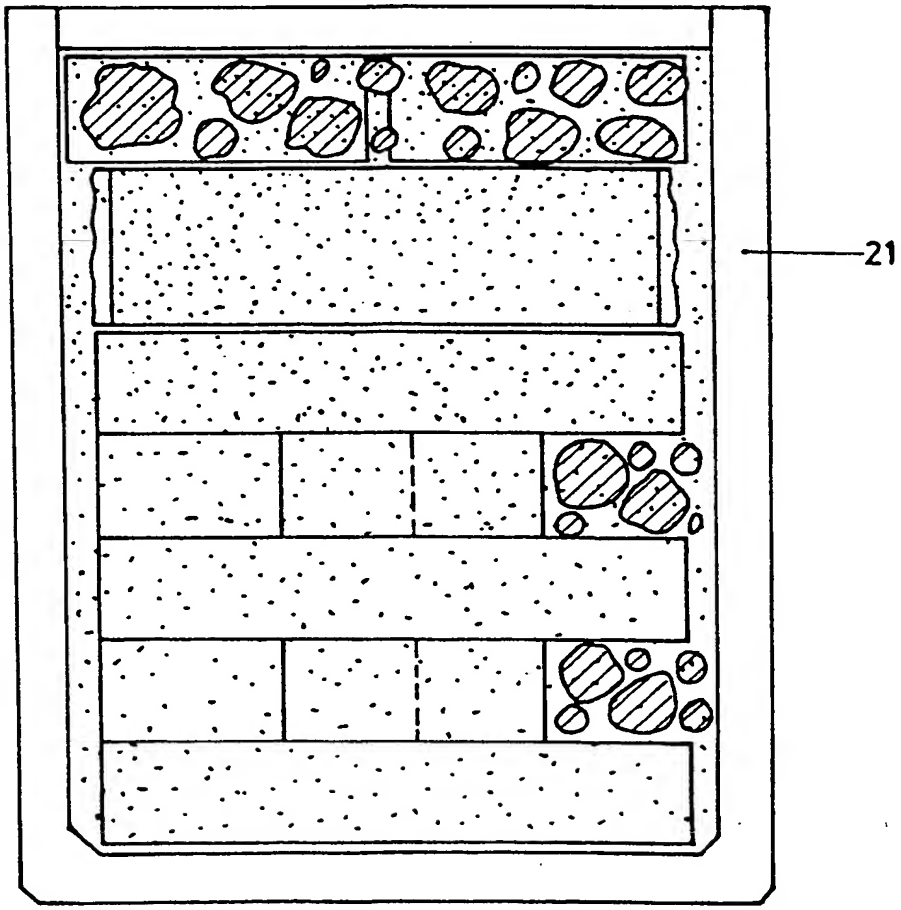


FIG.2

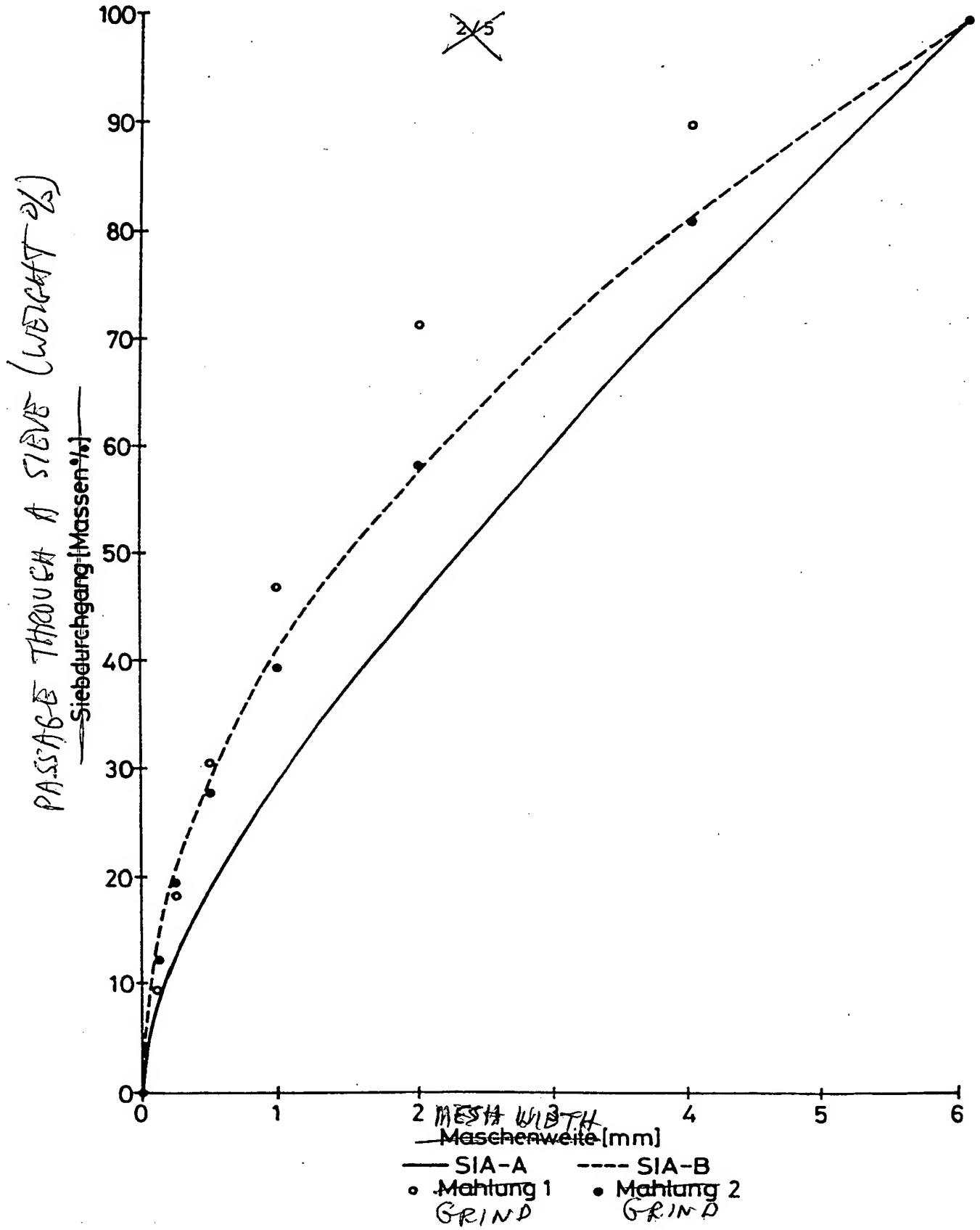

2/5
PASSAGE THROUGH A SIEVE (WEIGHT %)
Siebdurchgang [Massen%]
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
MESH WIDTH
Maschenweite [mm]
SIA-A
SIA-B
Mahlung 1
Mahlung 2
GRIND
GRIND

FIG.3

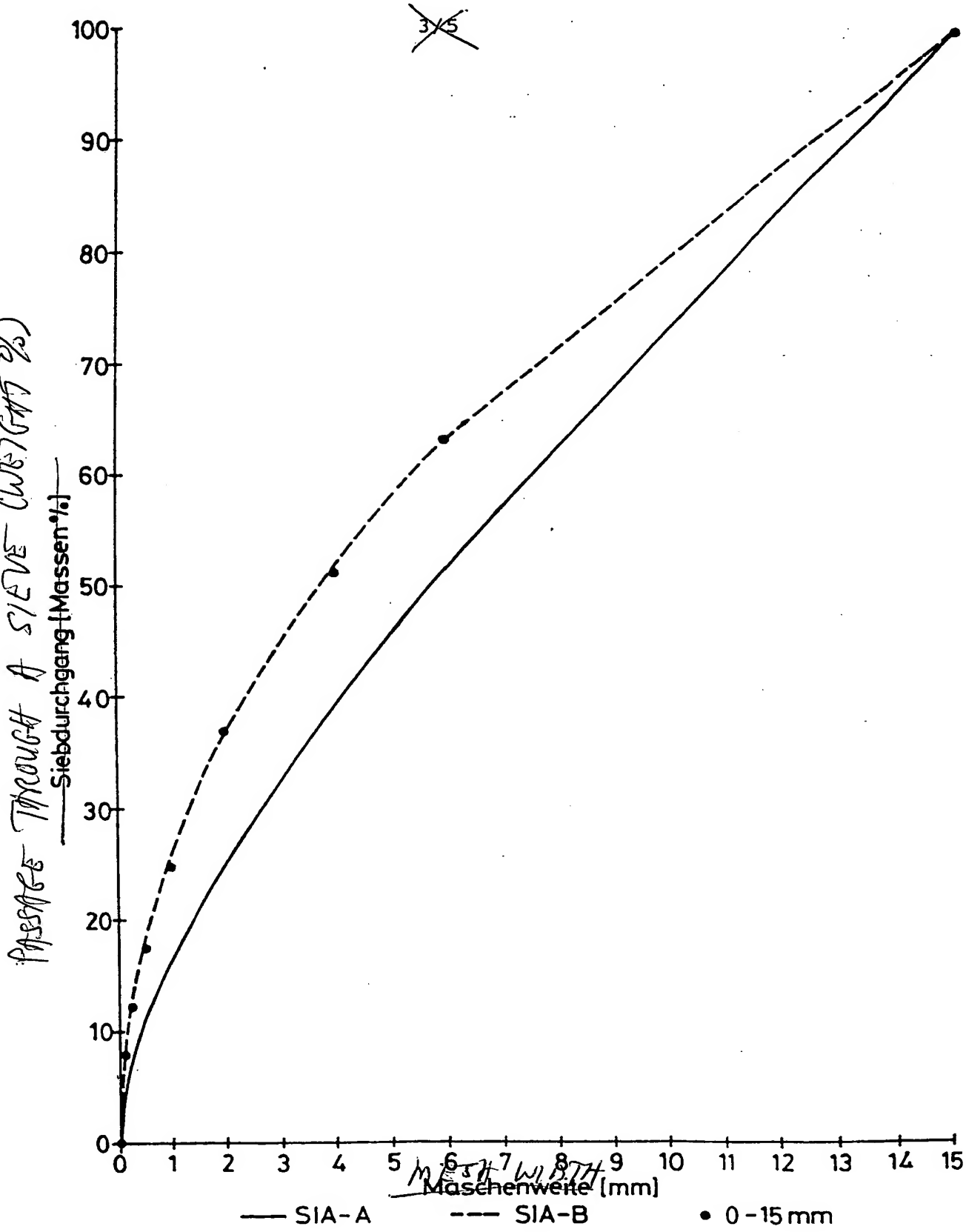

100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Siebdurchgang [Massen%]
PASSAGE THROUGH A SIEVE (WEIGHT %)
Maschenweite [mm]
MESH WIDTH
SIA-A
SIA-B
0-15 mm

FIG.4

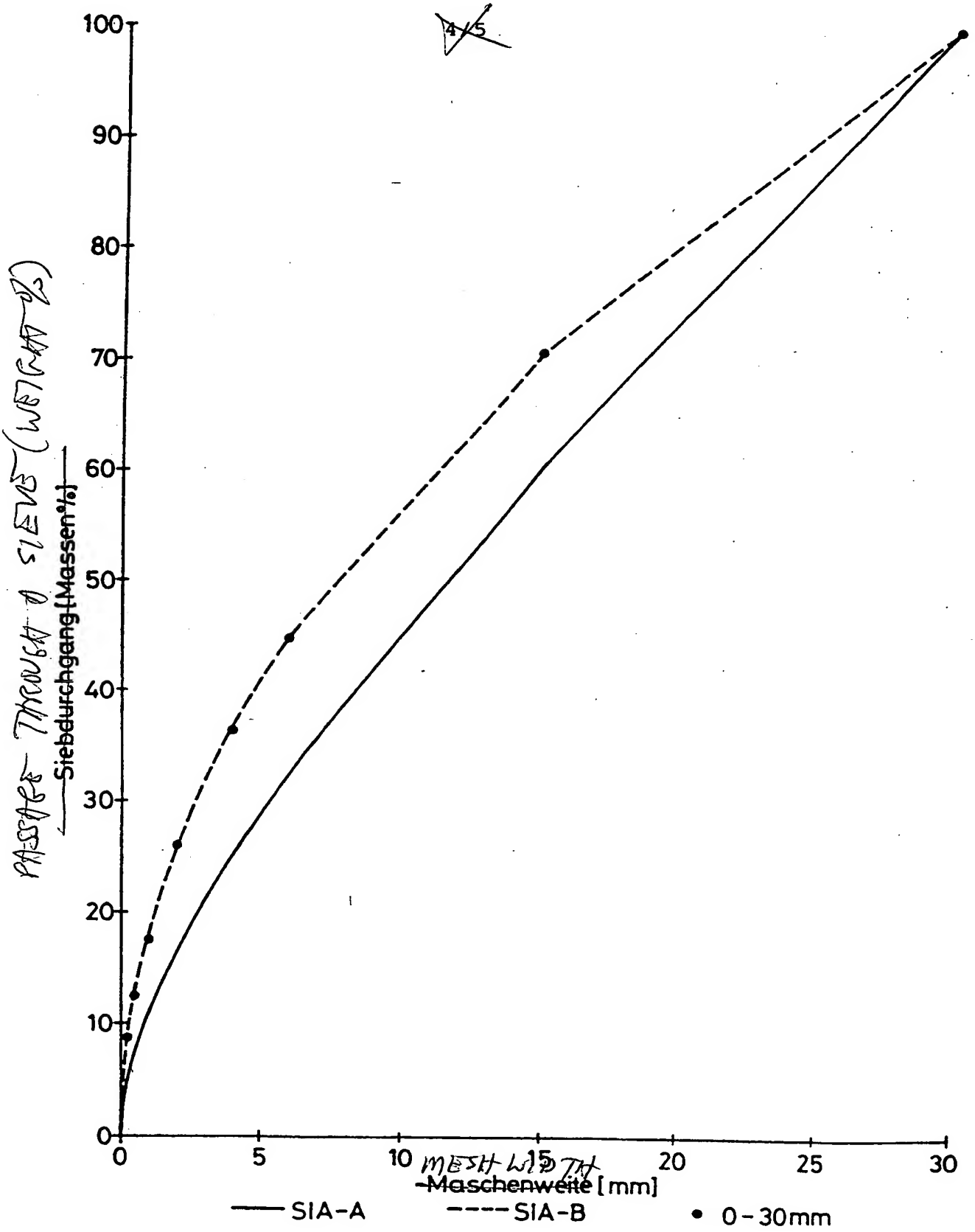
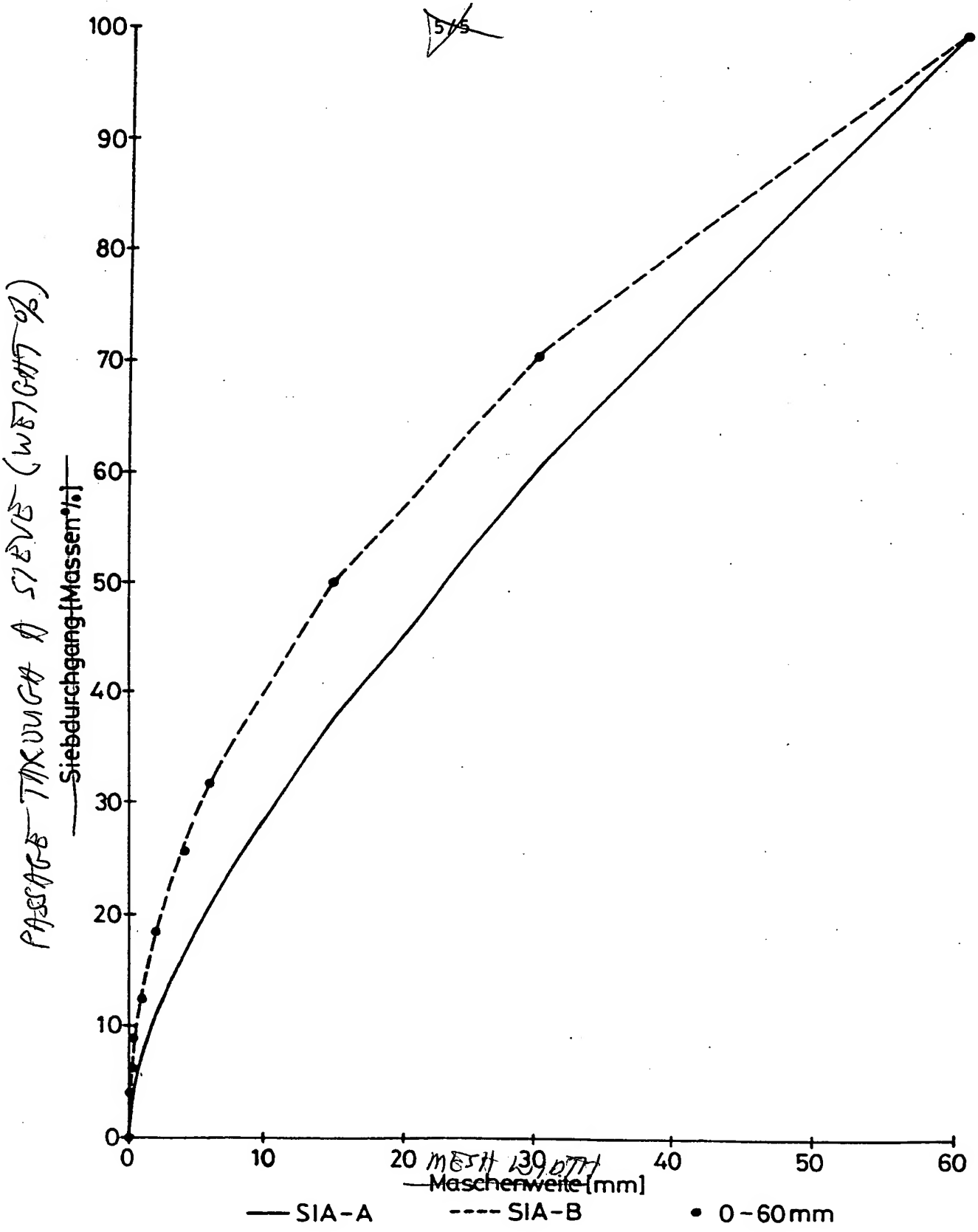

100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
Siebdurchgang [Massen%]
Maschenweite [mm]
SIA-A
SIA-B
0-30mm

FIG.5

5/5


100
90
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0
0
10
20
30
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50
60
Siebdurchgang [Massen%]
Maschenweite [mm]
SIA-A
SIA-B
0-60mm

FIG.6